CHAPTER NO: 1 & 2

1. Position vector of a point P(a, b, c) in xz-plane is given by
(a) **r** = a**i** + b**j** **(b) r = a i + c k** (c) **r** = b **j** + c**k** (d) **r** = a**i** + b**y** + c**k**
2. Which of the following is a vector quantity?
(a) **torque** (b) speed (c) density (d) work
3. Scalar product of vector **A** is equal to
(a) $\mathbf{A}^2$ (b) zero (c) one (d) **i.j**
4. If **A** x **B** = **0**, then it can be concluded that the two vectors are
(a) unit vectors (b) perpendicular to each other **(c) parallel to each other** (d) position vectors
5. The magnitude of $(\hat{j} \, x \, \hat{k})$ *is*
(a) 1 (b) -1 (c) zero (d) 2 $\hat{i}$
6. The angle between X-axis, Y-axis and Z-axis is
(a) 45^o (b) 60^o (c) 75^o **(d) 90^o**
7. The magnitude of rectangular components of a vector are equal if its angle with x-axis is
(a) 45^o (b) 30^o (c) 60^o (d) 90^o
8. When a vector is multiplied by a negative number then its
(a) direction changes (b) direction remains same **(c) direction reverses** (d) magnitude must change
9. If x-component of a vector is positive and y-component is negative, the vector lies in
(a) 1^{st} quadrant (b) 2^{nd} quadrant (c) 3^{rd} quadrant **(d) 4^{th} quadrant**
10. The magnitude of cross product of two vectors is maximum, when angle b/w them is
(a) 0^o (b) 45^o **(c) 90^o** (d) 180^o
11. If **A = 2 i + j + 2k,** then A is equal to
(a) zero **(b) 3** (c) 9 (d) 5
12. If magnitude of **a**+**b** = magnitude of **a-b**, then angle b/w **a** and **b**
(a) 0^o **(b) 45^o** (c) 90^o (d) 180^o
13. If line of action of force passes through axis of rotation of origin then its torque is
(a) **zero** (b) maximum (c) minimum (d) infinite
14. The magnitude of 2/3 **i** – 1/3 **j** + 2/3 **k** is
(a) zero (b) **1** (c) 3 (d) 1/3
15. Which of the following is a vector quantity?
(a) power (b) inertia (c) entropy (d) **tension**
16. Which pair of following forces can give magnitude of resultant force equal to zero?
(a) 2N & 2N (b) 1N & 4N (c) 2N & 5N (d) 1N & 2N
17. The resultant of two forces 30 N and 40 N acting at an angle of 90^o with each other, is
(a) 30 N (b) 40 N **(c) 50 N** (d) 70 N
18. The scalar product of two vectors is maximum, when they are
(a) **parallel** (b) perpendicular (c) anti parallel (d) at an angle of 60^o
19. When two vectors are anti-parallel, the angle between them is
(a) 0^o (b) 270^o (c) 90^o **(d) 180^o**
20. The magnitude of cross product and dot product of two vectors are equal, the angle b/w vectors is
(a) zero **(b) 45^o** (c) 90^o (d) 180^o

21. The magnitude of a unit vector is
(a) zero **(b) 1** (c) 2 (d) 3
22. Which of the following is the example of a vector quantity?
(a) **torque** (b) speed (c) density (d) work
23. The resultant of two forces of 5 N each, acting on an object of mass 5 kg in opposite direction is
a. **zero** (b) 5 N (c) 10 N (d) 15 N
24. Head to tail rule is used for
(a) **Addition of vectors** (b) subtraction of vectors (c) multiplication of vectors (d) division of vectors
25. If x-component of a vector is negative and y-component is positive, the vector lies in
(a) 1^{st} quadrant **(b) 2^{nd} quadrant** (c) 3^{rd} quadrant (d) 4^{th} quadrant
26. If both x and y components of a vector are negative, the proper angle of the vector is calculated as
(a) $\theta = 180 + \varphi$ (b) $\theta = 180 - \varphi$ (c) $\theta = \varphi$ **(d) $\theta = 360 - \varphi$**
27. The cross product of two vectors will be maximum at an angle of
(a) 0^o (b) 60^o **(c) 90^o** (d) 180^o
28. The scalar product of two vectors **A** and **B** will equal to zero if the angle between them is
a. 0^o **b. 90^o** c. 120^o d. 180^o
29. The magnitude of resultant is 5 units. The magnitude of one of its rectangular component is 4 units. The magnitude of other component is equal to
(a) 5 (b) 4 **(c) 3** (d) 2
30. Reverse process of vectors addition is called
(a) subtraction of vectors **(b) resolution of vector** (c) obtaining unit vector (d) product of vectors
31. Which of the following is a vector quantity?
(a) power (b) inertia (c) mass **(d) acceleration**
32. A force of 10 N is acting along x-axis, its component along y-axis is
(a) 10 N (b) 5 N (c) 8.66 N **(d) zero**
33. Mathematically unit vector is given by
(a) $\hat{\mathbf{A}} = \mathbf{A}/A$ (b) $\hat{\mathbf{A}} = \mathbf{A}+\mathbf{A}$ (c) $\hat{\mathbf{A}} = A/\mathbf{A}$ (d) $\hat{\mathbf{A}} = \mathbf{A}.\mathbf{A}$
34. The S.I. unit for intensity of light is;
a. radian b. mole **c. candela** d. ampere
35. The number of base units are;
a. Seven b. Two c. Three d. Four
36. Two forces of magnitude F act perpendicular to each other. The angle made by resultant force with the horizontal will be
a. 90^o b. 60^o **c. 45^o** d. 30^o
37. S.I unit of solid angle is
a. radian **b. ste-radian** c. candela d. mole
38. The first digit dropped is less than 5, the last digit retained is;
a. Decreased by one b. Increased by one **c. unchanged** d. All of these
39. The scalar product of two vectors **A** and **B** will be maximum if the angle between them is
a. 0^o b. 90^o c. 120^o d. 180^o
40. The magnitude of resultant is 5 units. The magnitude of one of its rectangular component is 3 units. The magnitude of other component is equal to
(a) 5 **(b) 4** (c) 3 (d) 2
41. The dimension of force
(a) $[ML^2T^{-2}]$ (b) $[ML^{-2}T^{-2}]$ (c) $[MLT^{-1}]$ **(d) $[MLT^{-2}]$**

42. The SI unit of pressure in terms of base units are

a. kg m^{-1} s^{-2} b. kg m^{-1} s^{-3} c. kg m s^{-2} d. kg m^{-2}

43. The significant figures in 0.0482 are

a. 2 **b. 3** c. 4 d. 5

44. The dimension of modulus of elasticity (E) is

a. $[ML^{-1}T^{-2}]$ b. $[MLT^{-2}]$ c. $[ML^{-1}T]$ d. $[ML^{-2}T^{-2}]$

45. The branch of physics which deals with study of structure and properties of solid is called

a. Solid State Physics b. Mechanics c. Particle Physics d. Nuclear Physics

46. Resultant of two forces 4 N and 3N inclined at an angle of 90^o

a. 1 N b. 2 N c. 4 N **d. 5 N**

47. Two forces of 60 N and 80 N acting on a body opposite of each other are added. Their resultant is

a. 20 N b. 140 N c. 4800 N d. cannot be added

48. The cross product **j** x **i** is equal to

a. **k** **b**. **-k** c. 1 d. zero

49. Magnitude of cross product of two parallel vectors **a** and **b** is equal to

a. ab cos 0 **b. 0** c. 2 ab d. ab/2

50. The base units for power are;

a. kg m^2 s^{-2} b. kg m s^{-2} c. kg m^{-1} s^{-3} **d. kg m^2 s^{-3}**

51. The number of supplementary units are;

a. Seven **b. Two** c. Three d. Four

52. Physics is a quantitative science based on primarily on:

a. fundamental quantities b. definitions c. description d. **Experiments and measurements**

53. The error produced due to faulty apparatus is called;

a. Random error **b. Systematic error** c. Personal error d. None of these

54. The number of significant figures of 8.07 x 10^3 are;

a. Three b. Four c. Five d. Seven

55. In rotational motion, the analogy of force is

a. Rotational inertia b. moment of inertia **c. Torque** d. Acceleration

56. The SI unit of pressure is

a. watt b. joule **c. pascal** d. newton

57. The significant figures in 0.04820 are

a. 2 b. 3 **c. 4** d. 5

58. The scientific notation of a number 0.0056 is

a. $5.6x10^{-2}$ **b. $5.6x10^{-3}$** c. 5.6 d. 56

59. Physical quantities are divided into

(a) **two categories** (b) three categories (c) four categories (d) five categories

60. The computer chips are made from

a. Germanium **b. Silicon** c. Sand d. Aluminum

61. A precise measurement is one which has

a. Zero precision **b.** absolute precision c. Maximum precision d. less precision

62. The first digit dropped is more than 5, the last digit retained is;

a. Decreased by one **b. Increased by one** c. unchanged d. All of these

63. Magnitude of cross product of two perpendicular vectors **a** and **b** is equal to

a. ab cosθ b. 0 c. ab sinθ **d. ab**

64. The dimension of work is

a. $[ML^{-2}T^{-2}]$ b. $[MLT^{-2}]$ c. $[ML^{2}T^{-3}]$ d. None of these

65. If x_1= (10.5±0.1) cm and x_2= (26.8±0.1) cm then x_2-x_1 is given by

a. (16.3+0.1) cm **b. (16.3±0.2) cm** c. (16.1±0) cm d. (16.3±0) cm

66. The sum of three numbers, 2.7543, 4.10 and 1.273 up to correct decimal place is

a. 8.12 **b. 8.13** c. 8.1273 d. 8.127

67. The solid angle subtended at the centre of a sphere is

2π **b. 4π** c. 6π d. 3 π

CHAPTER NO: 3

1. The horizontal range of projectile at 55^o with horizontal is same at an angle

a. 25^o b. **35^o** c. 45^o d. 65^o

2. Which of the following quantity can be calculated from the velocity time graph:

a. **Acceleration** b. Velocity c. Impulse d. Change of time

3. As a rocket moves upward, its acceleration

a. **increases** b. decreases c. remains constant d. can't be calculated

4. The time rate of change in momentum of an isolated system is also called

a. **force** b. acceleration c. torque d. impulse

5. The property of a body due to which it oppose the change in its state is called

a. momentum b. torque c. weight **d. inertia**

6. When velocity time graph is a straight line, then

a. Velocity is constant b. acceleration is uniform c. velocity is variable d. acceleration is zero

7. Acceleration is always produced in the direction of

a. velocity b. torque c. angular momentum **d. force**

8. The distance covered by a freely falling body is 2 s will be

a. 4.9 m **b. 19.6 m** c. 9.8 m d. 39.2 s

9. Laws of motion are valid in a frame of reference which is

a. **inertial** b. non-inertial c. both inertial & non inertial d. none of these

10. In projectile motion, vertical component of the velocity

a. remains constant b. decreases **c. increases** d. changes continuously

11. Rate of change of momentum is equal to

a. mass b. impulse **c. force** d. none of these

12. The range of projectile is maximum at an angle of

a. zero degree b. 30^o **c. 45^o** d. 60^o

13. The horizontal range and height of projectile are equal at an angle of

a. 75^o **b. 76^o** c. 77^o d. 78^o

14. The range of the projectile is directly proportional to

a. $\sin^2\theta$ **b. sin 2θ** c. sin θ d. 2 sinθ

15. The acceleration of projectile at the highest point is

a. zero **b. 9.8 ms^{-2}** c. 19.6 ms^{-2} d. 32.2 ms^{-2}

16. Newton's first law defines

a. **force** b. speed c. acceleration d. displacement

17. A 10 N force is applied on a body which produces acceleration of 1 ms^{-2} in it, mass of the body is
a. **10 kg** b. 1 kg c. 5 kg d. 20 kg

18. An object have mass 10 kg moving with acceleration 5 ms^{-2}. The force applied on it is
a. 1 N b. 10 N c. 15 N **d. 50 N**

19. When a bullet is fired by a gun, recoil is produced in
a. **gun** b. bullet c. both gun and bullet d. no recoil is produced

20. A 5 kg object is falling freely, the apparent weight of the object is
a. 5 N b. 9.8 N c. 19.6 N **d. zero**

21. The motion of a rocket is in accordance with law of conservation of
a. **linear momentum** b. energy c. mass d. angular momentum

22. Vertical height covered by a projectile when it is thrown horizontally from certain height if it takes 2 seconds to hit the ground.
a. 4.9 m **b. 19.6 m** c. 39.2 m d. 44.1 m

23. The horizontal component of a projectile moving with an initial velocity of 500 m s^{-1} at angle of 60^{o} with the X-axis is equal to
a. 150 m s^{-1} **b. 250 ms^{-1}** c. 0 ms^{-1} d. 625 ms^{-1}

24. The area under the velocity time graph is equal to
a. Acceleration b. Velocity **c. distance traveled** d. Change of time

25. The of the burnt gases ejected from the back of rocket is
a. 3000 ms^{-1} b. 3500 ms^{-1} **c. 4000 ms^{-1}** d. 4500 ms^{-1}

26. The horizontal component of a projectile throughout its motion
a. **remains constant** b. increases c. becomes zero d. decreases

27. When the body is moving with constant acceleration then instantaneous acceleration is equal to
a. Displacement **b. Average acceleration** c. Average velocity d. None of these

28. The total change in momentum of an isolated system is
a. maximum b. minimum **c. zero** d. None of these

29. When heavy body collides elastically with light body at rest, velocity of light body after collision
a. remains same **b. becomes double** c. same but in opposite direction d. becomes zero

30. A neutron is in head-on elastic collision with a stationary nitrogen nucleus. The mass of a nitrogen nucleus is 14 times greater than the mass of a neutron. The velocity of neutron after collision is
(a) Zero.
(b) less in magnitude than its initial velocity.
(c) less in magnitude than the final velocity of nitrogen atom.
(d) equal in magnitude to its initial velocity but in the opposite direction.

31. Which of the following statements relating to Newton's third law is not correct?
(a) The two forces must be of same type.
(b) The two forces must act on different bodies.
(c) The two forces are always opposite in direction.
(d) The two forces are equal and opposite so the bodies are in equilibrium.

32. The shortest distance between two points is called
a. speed b. distance c. acceleration **d. displacement**

33. The slope of the velocity time graph is equal to
a. Acceleration b. Velocity c. Distance covered d. Change of time

34. When the values of average and instantaneous velocities are equal then body is said to be moving with
a. uniform speed b. uniform acceleration **c. uniform velocity** d. average velocity

35. When a massive body collides elastically with a light stationary body, velocity of massive body after collision
a. massive body comes to rest b. becomes double c. same but in opposite direction **d. remains same**

36. Pull of earth on a mass of 20 kg on the surface of earth is

a. 19.6 N b. 20 N **c. 196 N** d. 1960 N

37. Inertia of a body is measured in terms of

a. **its mass** b. its weight c. its force d. its velocity

38. To cover maximum horizontal distance, a long jumper must jump at an angle of

a. 20^{o} b. 30^{o} **c. 45^{o}** d. 60^{o}

39. A collision in which K.E of a system remains constant is called

a. inelastic collision **b. elastic collision** c. both elastic and inelastic d. none of these

40. Before launch of a rocket, mass of fuel of rocket consist of approximately

a. 40 % of mass of rocket b. 50 % of mass of rocket c. 60 % of mass of rocket **d. 80 % of mass of rocket**

41. A particle collides elastically with another particle of same mass at rest, the velocity of incident particle

a. becomes double **b. becomes zero** c. remains same d. same but opposite

42. A projectile has initial velocity 9.8 m/s. The maximum height gained by the projectile is equal to

a. 4.9 m b. 9.8 m c. 19.6 m d. zero

43. For which pair of angle, the horizontal range of a projectile is equal

a. 30^{o} & 60^{o} b. 20^{o} & 30^{o} c. 40^{o} & 60^{o} d. 30^{o} & 90^{o}

44. Acceleration of a body moving with uniform velocity is

a. $9.8\ m/s^2$ **b. zero** c. not zero d. variable

45. According to Newton's second law of motion, the magnitude of force is directly proportional to

a. velocity **b. acceleration** c. inertia d. mass

46. The dimension of force are

a. **MLT^{-2}** b. M^2LT^{-2} c. MT^{-2} d. ML^2T

47. The discuss used by an athlete has a mass of 1 kg. Its weight in Newton is

a. 100 N b. 98 N c. 80 N **d. 9.8 N**

48. When a person reaches the top of a high mountain

a. his mass increases b. his weight increases c. his mass decreases **d. his weight slightly decreases**

49. Acceleration of two objects of different masses allowed to fall freely is

a. variable **b. same** c. different for different heights d. different for different objects

50. In an elastic collision of two bodies having equal masses

a. K.E is lost b. momentum is lost c. P.E. is lost **d. K.E and momentum are conserved**

51. Range of projectile is

a. $2 v_i \sin\theta/g$ b. $2 v_i^2 \sin\theta/g$ c. $v_i^2 \sin\theta/g$ **d. $v_i^2 \sin2\theta/g$**

52. Horizontal range of projectile is related with maximum range according to the relation

a. $R = R_{max} \sin\theta$ b. $R = R_{max} \sin2\theta/g$ c. $R_{max} = R \sin2\theta/g$ **d. $R = R_{max} \sin2\theta$**

53. The horizontal range of projectile at 30^{o} with horizontal is same at an angle of

a. 40^{o} b. 45^{o} **c. 60^{o}** d. 90^{o}

54. Water flows out from a pipe at 3 kg/s and its velocity changes from 5m/s to zero on striking the wall. The force due to water flows is

a. 3 N b. 5 N c. 10 N **d. 15 N**

55. S.I. units of impulse is

a. kg m **b. N s** c. N d. kg m s

56. The unit of impulse is same as that of

a. force b. weight **c. momentum** d. acceleration

57. A cricket ball is hit so that it travels to reach the maximum height 44m, its initial velocity is

a. 10 m/s b. 15 m/s **c. 29.4 m/s** d. 12.2 m/s

C H A P T E R NO: 4

1. The S.I unit of power
   (a) joule **(b) watt** (c) newton (d) dyne
2. Photocell converts light energy into
   (a) Chemical energy **(b) Electrical energy** (c) potential energy (d) heat energy
3. Energy stored in a winding spring is
   (a) Elastic potential energy (b) Electrical energy (c) Solar energy (d) K.E
4. The S.I unite of work is
   (a) joule (b) newton (c) BTU (d) dyne
5. The escape velocity on the surface of earth is given by formula.
   (a) $\sqrt{gR}$ (b) $\sqrt{2gR}$ (c) $\sqrt{2rR}$ (d) 2gR
6. If the direction of forces is perpendicular to the direction of motion of a body, the work done is
   (a) Minimum (b) Maximum **(c) Zero** (d) Infinity
7. The dot product of force and velocity is called
   (a) **Power** (b) Work (c) Energy (d) force
8. The work will be negative when angle b/w force and displacement
   (a) 45^o (b) 90^o **(c) 180^o** (d) 0^o
9. Work done in a gravitation field along a closed path is
   (a) **Zero** (b) Maximum (c) positive (d) Negative
10. The source of tidal energy is
    (a) Pull of earth (b) pull of sun **(c) pull of moon** (d) None of these.
11. The area under force displacement graph represents
    (a) **work done** (b) power (c) force (d) momentum
12. The force which cannot do work on the body on which it acts is called
    (a) electric force (b) frictional force **(c) centripetal force** (d) gravitational force
13. K.E can be defined as the dot product of
    (a) momentum and force (b) force and velocity **(c) avg. momentum and velocity** (d) none of these
14. 15 joules of work is done in 5 s, the power is equal to
    (a) 45 watt **(b) 3 watt** (c) 1/3 watt (d) 20 watt
15. If speed of a body is doubled, then its K.E
    (a) becomes double (b) remains same **(c) becomes four times** (d) becomes half
16. The escape velocity of the object from the earths is
    (a) 7.9 km/s **(b) 11 km/s** (c) 11.7 km/s (d) infinite
17. one kilowatt hour work is equal to
    (a) 0.36 MJ **(b) 3.6 MJ** (c) 36 MJ (d) 360 MJ
18. The dimensions of impulse are the same as that of
    (a) energy (b) work (c) power **(d) momentum**
19. As we move a body up above the surface of earth, the change of P.E will always be
    (a) negative **(b) positive** (c) zero (d) infinity
20. The K.E of a body of mass 2 kg and momentum 2 Ns is equal to
    (a) 1 J (b) 2 J (c) 3 J (d) 4 J
21. Geysers usually occur in
    a. cold region **b. volcanic region** c. mild hot region d. All of these
22. When speed of a body is doubled its
    a. K.E is doubled b. P.E is doubled **c. Momentum is doubled** d. None of these

23. An object of mass 3 kg placed on the surface of table 2 m high. It is moved on the surface by 4 m the change in P.E. is

a. Zero b. 9.8 J c. 19.6 J d. 329 J

24. The work done by a variable force in moving an object between two points is equal to area under

a. F vs d curve b. **Fcosθ vs d curve** c. Fsinθ vs d curve d. zero

25. The tidal energy is due to the pull of

(a) Sun (b) earth **(c) moon** (d) All of these

26. The work done will be maximum if the angle between force **F** and displacement **d**

(a) 45^o (b) 90^o (c) 180^o **(d) 0^o**

27. The dimensions of work are

(a) MLT^{-1} (b) MLT^{-2} **(c) ML^2T^{-2}** (d) MLT

28. The field in which work done in moving a body along a closed path is zero, is called

(a) Electric field (b) magnetic field (c) gravitational field **(d) conservative field**

29. If a body of mass of 2 kg is raised vertically through 2m then the work done will be

(a) 38.2 J **(b) 39.2 J** (c) 40 J (d) 392.1 J

30. The ability or capacity to do work is called

(a) force (b) power (c) kinetic energy **(d) energy**

31. The energy consumed by 60 watt bulb in 2 seconds is

(a) 120 J (b) 60 J (c) 30 J (d) 0.02 J

32. The value of acceleration due to gravity at center of earth is

(a) **Zero** (b) $9.8\ m/s^2$ (c) infinity (d) Maximum

33. Work done by the frictional force is

(a) $9.8\ m/s^2$ (b) Zero **(c) Negative** (d) positive

34 The kinetic energy of a 50 gm. bullet moving at a speed of 500 m/s is

(a) 2500 J (b) 1250 J (c) 25000 J **(d) None of these**

35. All the frictional forces are

(a) Conservative forces **(b) Non-Conservative** (c) Constant forces (d) None of these.

36. Kilowatt hour is unit of

(a) power **(b) work** (c) force (d) momentum

37. 1 kWh energy is equal to

(a) 3.6 J (b) $3.6x10^5$ J (c) $3.6x10^4$ J **(d) 3.6 MJ**

38. The energy stored by the water in dam is

(a) heat energy **(b) P.E** (c) K.E (d) nuclear energy

39. The work done by a force 100 N applied parallel to direction of motion upto 20 m is

(a) 10 J (b) 20 J (c) 200 J **(d) 2000 J**

40. A 60 kg man runs up a long stairs in 5 seconds. If he covers a height of 5 m and a horizontal distance of 10 m, his power

a. 490 watt b. 250 watt **c. 588 watt** d. 2450 watt

41. The intensity of the solar energy reaching the earth's surface is about:

a. 1.4 KWm^{-2} b. 1.6 KWm^{-2} c. 1.8 KWm^{-2} d.1.0 KWm^{-2}

42. The dimension ratio of work to power is

a. J **b. T** c. L d. KWH

43. The ratio between orbital and escape velocities are

a. 1 b. 2 c. $\sqrt{2}$ **d. $\frac{1}{\sqrt{2}}$**

44. Which one is the biggest unit of energy?

a. Erg b. joule c. watt hour **d. Kilowatt hour**

45. A stone is thrown up from the surface of the earth, when it reaches at maximum height, its K.E. is
a. mgh b. ½ mv^2 **c. zero** d. 2 mgh

46. The force which cannot do work on the body on which it acts is called
a. electric force b. frictional force c. gravitational force **d. centripetal force**

47. 9 joules of work is done in 3sec then power is
a. 6 watt **b. 3 watt** c. 18 watt d. 2 watt

48. The value of solar constant is
a. 1.4 KWm^{-2} b. 1.6 KWm^{-2} c. 1.8 KWm^{-2} d.1.0 KWm^{-2}

49. When sun light enters into atmosphere its total energy reduces due to
a. reflection from dust particles b. absorption from dust particles
c. scattering from dust particles **d. All of these**

50. Absolute P.E of an object at infinite height w.r.t. earth is taken as
a. negative **b. zero** c. minimum d. virtual

51. The sources of geothermal energy is / are
a. radioactive decay b. residual heat of earth c. compression of materials **d. All of these**

52. The most common method for conversion of biomass into fuel is/are
a. direct combustion b. fermentation **c. both a & b** d. none of these

53. The strong water waves on the surface of ocean are produced due to
a. wind b. tidal movements c. pull of sun **d. both a & b**

54. The work done on a body will be negative when angle b/w force and displacement is
a. less than 90^o **b. greater than 90^o** c. equal to 90^o d. equal to zero

55. Which of the following is conservative force
a. gravitational force b. magnetic force c. electric force **d. all of these**

56. Which of the following is non-conservative force
a. elastic spring force b. electric force **c. propulsion force** d. gravitational force

57. Which of the following sources is renewable source of energy
a. **tides** b. coal c. natural gas d. oil

CHAPTER NO: 5

1. When a body moves along a circular path, it velocity
(a) remains same (b) become zero **(c) changes continuously** (d) sometime changes
2. The S.I unit of angular displacement is
(a) degree **(b) radian** (c) revolution (d) meter
3. A body rotating in a circle of radius 1m with an angular speed 10 rad/s has the tangential velocity
(a) 2 m/s (b) 5 m/s **(c) 10 m/s** (d) 20 m/s
4. One radian is equal to
(a) 67.3^o (b) 60^o **(c) 57.3^o** (d) 47.3^o
5. The moment of inertia is measured in
(a) **$kg\ m^2$** (b) kgm^{-2} (c) N s (d) rad s^{-1}
6. The moment of inertia for ring or hoop is
(a) mr^2 (b) 2/5 mr^2 (c) ½ mr^2 (d) 1/12 mr^2
7. If a person sitting on a rotating stool with his arm outstretched, contracts his arms, his angular speed
(a) decreases **(b) increases** (c) remains constant (d) becomes zero

8. Every point of rotating rigid body has same
(a) **angular velocity** (b) linear velocity (c) linear acceleration (d) linear distance
9. Angular momentum is maximum, when angle between linear momentum and moment is
(a) 30^o (b) 45^o (c) 60^o **(d) 90^o**
10. When a body is rotating with constant angular velocity, it tangential acceleration is
(a) **Zero** (b) maximum (c) minimum (d) none of these
11. A diver changes his body position to conserve the
(a) angular velocity (b) linear velocity (c) linear acceleration **(d) angular momentum**
12. A disc rolls down an inclined plane, it has
(a) translational K.E (b) rotational K.E (c) Gravitational P.E **(d) all of these**
13. When a body is moving in upward direction with an acceleration '**a**', it apparent weight
(a) **increases** (b) decreases (c) equal to real weight (d) becomes zero
14. A beaker with water is placed on the rotating table. When water in the beaker is increased then its angular velocity
(a) increases **(b) decreases** (c) unchanged (d) becomes zero
15. When a sphere rolls down an inclined plane, its gravitational P.E is converted into
(a) translation K.E (b) rotational K.E **(c) both a & b** (d) none of these
16. One Geo Stationary satellite covers a longitude of
(a) 110^o **(b) 120^o** (c) 125^o (d) 130^o
17. For normal gravitational field, gravity obeys
(a) Newton's first law (b) Newton's second law (c) Newton's third law **(d) inverse square law**
18. If a car moves with a uniform speed of 2 m/s in a circle of radius 0.4 m, its angular speed is
(a) **5 rad/s** (b) 4 rad /s (c) 0.8 rad /s (d) 0.2 rad /s
19. For a particle moving in a horizontal circle with constant angular velocity
(a) linear momentum is constant but energy varies (b) energy is constant but linear momentum varies
(c) both energy and linear momentum are constant (d) neither energy nor linear momentum are constant
20. The number of satellites which make global positioning system are
(a) 3 (b) 8 **(c) 24** (d) 48
21. When a body moves along a circular path, the angle between its linear velocity and angular velocity is
(a) zero (b) 30^o **(c) 90^o** (d) 180^o
22. The angular momentum L is defined by the equation
(a) L = mv (b) **L = r** x **F** (c) **L = p** x **r** **(d) L = r** x **p**
23. The angle subtended by the circumference of a circle of radius r is given by
(a) **2π** (b) π (c) 4π (d) π r
24. The moment of inertia for a disc is given by
(a) mr^2 (b) $2/5\ mr^2$ **(c) ½ mr^2** (d) $1/12\ mL^2$
25. When a stone is whirled in a horizontal circle with the help of a string, centripetal force is supplied by
(a) mass of stone **(b) tension in string** (c) velocity of stone (d) centripetal acceleration
26. The centripetal force performs
(a) maximum work (b) minimum work (c) negative work **(d) no work**
27. When the force is applied parallel to the axis of rotation of a body then angular momentum is
(a) maximum (b) minimum **(c) zero** (d) cannot be fined
28. A diver stretches his arms and legs in order to increases his
(a) **angular velocity** (b) moment of inertia (c) angular acceleration (d) angular momentum
29. The mud flies off the tyre of a moving bicycle in the direction of
(a) centre of wheel **(b) tangent to the wheel** (c) motion of the wheel (d) none of these
30. When a body is moving in downward direction with an acceleration 'a', it apparent weight is
(a) ma + mg **(b) mg-ma** (c) mg (d) zero

31. The SI units of angular momentum are

(a) kg m s^{-1} (b) kg m s^{-2} **(c) kg m^2 s^{-1}** (d) kg m^2 s^{-2}

32. Which of the following pair of physical quantities does not have same dimensions

(a) torque and energy (b) momentum and impulse

(c) energy and work **(d) mass and moment of inertia**

33. The value of g is maximum

(a) **at equator** (b) at poles (c) at centre of earth (d) between pole and equator

34. If a car moves with a uniform speed of 40 m/s in a circle of radius 0.4 m, its angular speed is

(a) 0.01 rad/s (b) 16 rad /s (c) 20 rad /s **(d) 100 rad /s**

35. As we go below the surface of earth, the value of g

(a) increases **(b) decreases** (c) remains constant (d) reduces to zero

36. The number of geo stationary satellites to cover whole earth are

(a) 3 (b) 8 (c) 24 (d) 30

37. When a body is moving along a circular path, then such a motion is called

(a) Vibratory motion **(b) rotatory motion** (c) linear motion (d) none of these

38. Angular displacement is

(a) Scalar quantity **(b) vector quantity** (c) basic quantity (d) none of thee

39. If the arc length of a circle equals its radius, then the angle subtended at the center will be

(a) 1 degree (b) one revolution **(c) one radian** (d) half revolution

40. Time rate of change of angular velocity called

(a) linear acceleration **(b) angular acceleration** (c) centripetal acceleration (d) vibration velocity

41. If the body is moving anticlockwise direction, the direction of angular acceleration is

(a) along the axis of rotation (b) perpendicular to the axis of rotation

(c) opposite to axis of rotation (d) none of these

42. The moment of inertia is analogue to

(a) **mass** (b) torque (c) force (d) momentum

43. In case of planets, centripetal force is provided by

(a) Coulomb's force (b) electrostatic force **(c) gravitational force** (d) magnetic force

44. The ratio of moment of inertia of disc and hoop is

a. 1/4 b. 4/2 c. 3/4 **d. 1/2**

45. The tendency of a rotating object to continue rotating is called

a. its linear momentum. **b. its moment of inertia**.

c. its torque. d. its angular momentum.

46. The weight of a body falling freely will be

a. mg + 6πη r v b. mg - 6πη r v **c. mg** d. zero

47. The minimum velocity required to put a satellite into orbit, is

(a) 5.9 km s^{-1} (b) 6.9 km s^{-1} **(c) 7.9 km s^{-1}** (d) 8.9 km s^{-1}

48. The expression for the orbital speed of a satellite is

(a) $[Gr/M]^{1/2}$ (b) $[M/Gr]^{1/2}$ (c) $[r/GM]^{1/2}$ **(d) $[M G/r]^{1/2}$**

49. The apparent weight of a man in a lift moving down with an acceleration of 9.8 m/s^2 is

(a) zero (b) 9.8 N (c) 19.6 N (d) infinity

50. The rotational K.E of disc and hoop is

(a) ½ Iω **(b) ½ $I\omega^2$** (c) $2I\omega^2$ (d) ½ $I^2\omega$

51. The linear velocity of disc moving down an inclined plane is

(a) $[gh]^{1/2}$ **(b) $[4/3\ gh]^{1/2}$** (c) $[2/3\ gh]^{1/2}$ (d) $[gh/2]^{1/2}$

52. A Geostationary satellite above the surface of earth is at the height of

(a) 27300 km (b) 30000 km **(c) 36000 km** (d) 42300 km

CHAPTER NO: 6

1. Water flows through a non-uniform pipe. The pressure will be low where
(a) Speed is low **(b) Speed is high** (c) Speed is Zero (d) None of these
2. The maximum drag force on a sphere falling with uniform velocity is 9.8N, its weight is
(a) 1 N **(b) 9.8 N** (c) 19.8 N (d) zero
3. Generally the blood pressure of a person
(a) remains constant **(b) increases with age** (c) decreases with age (d) none of these
4. Human blood pressure is measured in torr and 1 torr =
(a) 133.6 Nm^{-2} (b) 1.33.5 Nm^{-2} (c) 133.4 Nm^{-2} **(d) 133.3 Nm^{-2}**
5. Venturi meter is used to measure
(a) speed **(b) pressure** (c) viscosity (d) P.E
6. Equation of continuity is another form of law of conservation of
(a) **mass** (b) energy (c) momentum (d) All of these
7. The terminal velocity of fog droplet is very small due to its
(a) **Small mass** (b) temperature (c) viscosity (d) none of
8. For an ideal fluid in flow, the streamlines are
(a) **parallel** (b) perpendicular (c) anti-parallel (d) intersect each other
9. In case of flying aeroplane, the pressure of the air above the wings is________bottom of the wing
(a) equal to (b) greater than **(c) less than** (d) none of these
10. The high value of the human blood pressure is called
(a) **Systolic pressure** (b) Diastolic pressure (c) Normal pressure (d) None of these
11. Swing in the cricket ball is produced due to
(a) **Difference of air pressure** (b) Spin of the ball (c) Deflecting force (d) All of these
12. The equation F = 6 π η r υ is called
(a) Newton's Law **(b) Stoke's Law** (c) Ohm's Law (d) Faraday's Law
13. The smooth or steady flow of a fluid is called
(a) turbulent flow **(b) laminar flow** (c) simple flow (d) fast flow
14. If speed of body in a fluid increases then drag force on it
(a) increases (b) decreases (c) remains same (d) becomes zero
15. Sphygmomanometer is used to measure
(a) Speed (b) **Pressure** (c) Viscosity (d) P.E.
16. Law of conservation of energy is used to derive
(a) **Bernoulli's equation** (b)Venture relation (c) Torricelli's equation (d) Equation of Continuity
17. When temperature increases, the viscosity of the fluid
(a) **decreases** (b) increases (c) remains constant (d) becomes zero
18. The S.I. units of flow rate are
(a) m^2s^{-1} (b) m^3s^{-2} **(c) m^3s^{-1}** (d) m^2s^{-2}
19. The terminal velocity in case of spherical droplet is proportional to
(a) **square of radius** (b) radius (c) cube of radius (d) square root of radius
20. The dimensions of co-efficient of viscosity are
(a) MLT^{-1} (b) MLT^{-2} **(c) $ML^{-1}T^{-1}$** (d) ML^2T^{-1}
21. If a sphere object is falling with uniform velocity, then its weight is
(a) **equal to drag force** (b) greater than drag force (c) less than drag force (d) zero
22. Stoke's law holds for
(a) motion through free space **(b) motion through viscous medium**
(c) bodies of all shapes (d) all medium

23. Which of the following has minimum viscosity

(a) **air** (b) blood (c) water (d) glycerin

24. The device used for the measurement of liquid flow is

(a) manometer (b) barometer (c) hydrometer **(d) venturi meter**

25. The low value of the normal human blood pressure is called

(a) Systolic pressure **(b) Diastolic pressure** (c) Normal pressure (d) less pressure

26. The mathematical relation $v2 = \sqrt{2g(h2 - h1)}$ is known as

(a) equation of continuity (b) Bernoulli's equation **(c) Torricelli's theorem** (d) venture relation

27. A piece of ice is floating in a jar containing water. When the ice melts, then the level of water

(a) rises (b) falls **(c) remains unchanged** (d) rise of fall depends upon the mass of ice

28. In equation of continuity the units of Av is

(a) Cubic meter **(b) cubic meter /s** (c) m^2/s (d) square meter

29. The drag force on a spherical object falling through the air

(a) **increases with increase of speed** (b) increases with decrease of speed

(c) no change in drag force with change of speed (d) decreases with increase of size of object

30. The pressure entered by a column of mercury 76 cm high and at 0^oC is called

(a) 1 atm (b) $1\ N\ m^{-2}$ (c) 1 pascal (d) none of these

31. For which position will the maximum blood pressure in the body have smallest value

(a) standing upright (b) sitting **(c) lying horizontally** (d) standing on one's head

32. The maximum velocity attained by a spherical droplet when the drag force F and the weight of the droplet W become equal is called

(a) average velocity (b) root mean square velocity (c) uniform velocity **(d) terminal velocity**

33. Generally at higher velocities the flow is

(a) laminar **(b) turbulent** (c) very slow (d) very fast

34. The frictional effect between different layers of moving fluid is called

(a) density (b) pressure (c) force **(d) viscosity**

35. Normally human blood density is equal to

(a) $111\ kg\ m^{-3}$ **(b) 133.3 kg m^{-3}** (c) $80\text{-}120\ kg\ m^{-3}$ (d) water density

36. A fluid is called ideal fluid if

(a) it is non-viscous (b) it is incompressible (c) it has laminar flow **(d) all of these**

37. The velocity of efflux is measured by the relation

(a) $(gh)^{1/2}$ (b) $(gh/2)^{1/2}$ **(c) $(2gh)^{1/2}$** (d) $(4/3gh)^{1/2}$

38. A two meter high tank is full of water. A hole is made at the its middle. The speed of efflux

(a) 3.75 m/s **(b) 4.42 m/s** (c) 4.91 m/s (d) 5.11 m/s

39. The irregular flow of a fluid is called

(a) **turbulent flow** (b) laminar flow (c) steady flow (d) simple flow

40. Human blood pressure is measured in

(a) N m^{-2} (b) mm (c) N m (d) cm

41. Density of water is

(a) $10000\ kg\ m^{-3}$ **(b) 1000 kg m^{-3}** (c) $100\ kg\ m^{-3}$ (d) $10\ kg\ m^{-3}$

42. High concentration of red blood cells increases the viscosity of blood from

(a) 1-2 times (b) 2-3 times (c) 3-4 times **(d) 3-5 times**

43. Venturi duct in the carburetor of a car engine is used to

(a) mix patrol and air **(b) decrease pressure** (c) both a & b (d) none of these

44. Human blood

(a) is compressible **(b) is incompressible** (c) has large viscosity (d) has density equal to patrol

45. When the streamlines of the fluid are closer to each other, the pressure at that point
(a) **increases** (b) decreases (c) remains constant (d) becomes zero

46. The diameter of a pipe is 20 cm. it cross-sectional area is
(a) 3.14 cm^2 **(b) 314 cm^2** (c) 3140 cm^2 (d) 0.314 cm^2

47. Bernoulli's theorem is valid for
(a) laminar flow (b) turbulent flow **(c) both a & b** (d) irregular flow

48. When water enters to a pipe of smaller area from a pipe having larger area, its
(a) pressure remains constant **(b) pressure increases** (c) speed increases (d) speed decreases

49. Drag force acts on a body moving through a fluid
(a) along the motion of body (b) perpendicular to the motion of body
(c) opposite to the motion of body (d) at 60 degree angle to the direction of motion of body

50. 30 kg of water flows out from a pipe in 60 s. The mass flow per second of water is
(a) 2 kg/s **(b) 0.5 kg/s** (c) 180 kg/s (d) 1800 kg/s

51. The S.I units of coefficient of viscosity are
(a) **$kg\ m^{-1}\ s^{-1}$** (b) $kg\ m^2\ s^{-2}$ (c) $kg\ m\ s^{-2}$ (d) $N\ m\ s^2$

52. If volume of a sphere increases then terminal velocity
(a) remains same **(b) increases** (c) decreases (d) none of these

53. Terminal velocity is directly proportional to
(a) mass of object (b) square of radius of object **(c) both a&b** (d) inversely proportional to radius of object

54. Which of the following has highest viscosity
(a) water (b) milk **(c) honey** (d) glycerin

CHAPTER NO: 7

1. The maximum distance of vibrating body from the mean position when the body is executing SHM is called
a. displacement b. time period c. frequency **d. amplitude**

2. The sharpness of resonance is ________ proportional to damping
a. directly b. exponentially **c. inversely** d. not related

3. The wave form of body executing SHM is
a. pulsed wave **b. sine wave** c. square wave d. cosine wave

4. The time period of second pendulum is
a. 1 s **b. 2 s** c. 3 s d. 4 s

5. The formula for frequency of simple pendulum is
a. $\frac{1}{2\pi}\sqrt{\frac{l}{g}}$ **b. $2\pi\sqrt{\frac{l}{g}}$** c. $2\pi\sqrt{\frac{g}{l}}$ d. $\frac{1}{2\pi}\sqrt{\frac{g}{l}}$

6. A simple harmonic oscillator completes 30 vibrations in 5 seconds. Its frequency is
a. 30 Hz b. 150 Hz **c. 6 Hz** d. 5 Hz

7. The process in which energy is dissipated from oscillation system is known as
a. **Damping** b. Conduction c. Convection d. Thermionic

8. The vibration of a factory floor caused by the running of heavy machinery is an example of
a. **Forced vibration** b. Free vibration c. both a & b d. None of these

9. $[T^{-1}]$ is the dimension of
a. Time **b. Frequency** c. Force d. Acceleration

10. Heating is produced in a microwave oven by the phenomena
a. Total Internal Reflection b. Refraction **c. Resonance** d. Dispersion

11. If mass of the bob of a pendulum is doubled, its period

a. becomes half b. becomes one third c. becomes doubled **d. remains same**

12. Time period of horizontal mass spring system is given by _______

a. $\mathbf{2\pi\sqrt{\frac{m}{k}}}$ b. $2\pi\sqrt{\frac{k}{m}}$ c. $\frac{1}{2\pi}\sqrt{\frac{m}{k}}$ d. $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$

13. A system under going forced vibrations is known as

a. simple pendulum b. simple harmonic oscillator c. 2^{nd} pendulum **d. Driven harmonic oscillator**

14. Damping is a process whereby energy is __________ from the oscillating system

a. conserved **b. dissipated** c. both a & b d. none of these

15. If projection N starts it motion from upper extreme and subtends an angle of 45^o , then total phase is

a. 45^o b. 90^o c. 120^o **d. 135^o**

16. The angular speed of the mass attached to a spring is

a. $2\pi\sqrt{\frac{m}{k}}$ b. $2\pi\sqrt{\frac{k}{m}}$ c. $\frac{1}{2\pi}\sqrt{\frac{m}{k}}$ **d. $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$**

17. When a particle is moving along a circular path, its projection performs_________along the diameter.

a. linear motion b. vibratory motion **c. SHM** d. rotatory motion

18. In SHM the velocity of a particle is maximum at

a. **mean position** b. extreme position c. between mean and extreme d. none of these

19. Time period of simple pendulum is independent of

a. **mass** b. length c. acceleration due to gravity d. restoring force

20. If F = 0.08 N and x = 4cm then K is equal to

a. 8 N/m b. 6 N/m c. 4 N/m **d. 2 N/m**

21. The product of time period and frequency is

a. zero **b. 1** c. π d. 2

22. The oscillation in which amplitude decreased steadily with the time are called

a. natural oscillations **b. damped oscillations** c. free oscillations d. forced oscillations

23. If time period of simple pendulum is 2s, it frequency will be

a. 1 Hz b. 1.5 Hz **c. 0.5 Hz** d. 2 Hz

24. The time period of simple pendulum depends upon

a. **length of pendulum** b. mass of bob c. amplitude of pendulum d. mass of thread

25. If the amplitude of the simple pendulum is doubled, its time period

a. becomes one half b. becomes one third c. becomes doubled **d. remains constant**

26. S.I unit of spring constant K are

a. m^{-1} **b. $N\ m^{-1}$** c. $N\ m^{-2}$ d. $N\ m^{2}$

27. Length of simple pendulum whose time period is 1 s.

a. **0.25 m** b. 25 m c. 100 m d. 0.25 cm

28. The wave form of a body performing SHM is

a. Square wave **b. sine wave** c. circular wave d. pulse

29. The force responsible for producing the vibratory motion in simple pendulum is

a. mg cosθ **b. mg sinθ** c. mg tanθ d. mg

30. The amplitude of a body, performing SHM, at resonance

a. **is maximum** b. is minimum c. remains constant d. becomes zero

31. The frequency of horizontal mass spring system is given by_____________

a. $\mathbf{2\pi\sqrt{\frac{m}{k}}}$ b. $2\pi\sqrt{\frac{k}{m}}$ c. $\frac{1}{2\pi}\sqrt{\frac{m}{k}}$ d. $\frac{1}{2\pi}\sqrt{\frac{k}{m}}$

32. The restoring force in SHM is always

a. **directed towards mean position** b. directed away from mean position

c. directed at angle of 60^{o} d. directed at angle of 45^{o}

33. If projection N starts its motion from lower extreme and subtends a further angle of 45^{o} , then total phase is a. 180^{o} b. 270^{o} c. 290^{o} **d. 315^{o}**

34. When a simple harmonic oscillator is at its mean position, its

a. **K.E is maximum** b. P.E. is maximum c. K.E. is zero d. K.E. is minimum

35. Shock absorbers of a car is a practical example of

a. SHM b. forced oscillations **c. damped oscillations** d. resonance

36. If the spring of spring constant K is cut into two pieces then spring constant of each spring is

a. K **b. 2K** c. K/2 d. none of these

37. Tuning of radio is a best example of

a. mechanical resonance **b. electrical resonance** c. magnetic resonance d. all of these

38. The to & fro motion of a body about a mean position is called

a. Linear motion **b. Oscillatory motion** c. Rotatory motion d. none of these

39. The max. K.E of a mass attached to a spring and passing through its mean position is given by

a. $(K.E)_{max} = k x_o$ b. $(K.E)_{max} = k x_o^2$ c. $(K.E)_{max} = (k x_o)^2$ **d. $(K.E)_{max} = (1/2) k x_o^2$**

40. A body execute SHM, its P.E., K.E and total energy (T.E) are measured as a function of displacement x. Which of the following statement is true?

a. T.E = 0 when x=0 b. K.E is maximum when x is maximum

c. P.E is maximum when x = 0 **d. K.E is maximum when x = 0**

41. A body is executing SHM. What fraction of its total energy will be kinetic energy when its displacement from the mean position half of its displacement?

a. 1/2 b. 3/2 **c. 3/4** d. 1/4

42. A body is executing SHM motion with an amplitude A, the total displacement covered in a time equal to its Time-period will be

a. A **b. 4A** c. 2A d. zero

43. Which of the following is an example of damped oscillation?

a. mass attached to spring b. simple pendulum c. shock absorber of a car **d. All of these**

44. The frequency of a second's pendulum is

a. 1 Hz **b. 05 Hz** c. 1.5 Hz d. 2 Hz

45. The acceleration of a body performing SHM depends upon its

a. mass **b. time period** c. amplitude d. displacement

46. If 'f' is the frequency of a body performing SHM, its angular frequency is given by

a. $4\pi f$ **b. $2\pi f$** c. $3\pi f$ d. $\pi f/2$

47. If mass of simple pendulum becomes double, then its time period will be

a. double b. half c. four times **d. remains same**

C H A P T E R   NO: 8

1. When a wave reflects from boundary of the rare medium, the reflected wave, phase change will be

a. 0^o b. 60^o c. 90^o d. 180^o

2. The distance between the two consecutive nodes is

a. λ b. 2λ **c. $\lambda/2$** d. $\lambda/4$

3. The speed of sound in vacuum is

a. **Zero** b. 300 m/s c. 332 m/s d. 340 m/s

4. At what temperature the speed of sound in air becomes double.

a. 750^o b. 819^o c. 719^o **d. 859^o**

5. If the tension is made four times, the speed of the transverse waves will become

a. **double** b. three times c. four times d. remains constant

6. If the pressure of the gas is doubled, the velocity of sound in it will be

a. doubled b. three times c. four times **d. remains constant**

7. Red shift indicates that the stars

a. is moving towards earth **b. is moving away from earth**
c. is stationary d. none of these

8. Sound waves travel faster in

a. **solid** b. liquid c. gasses d. vacuum

9. Two waves can interfere only if they have

a. phase coherence b. same speed c. different frequencies **d. all of these**

10. The speed of sound is independent of

a. temperature b. density **c. pressure** d. medium

11. The error in the value of speed of sound calculated by Newton at STP is about

a. 14 % b. 15 % **c. 16 %** d. 18 %

12. The speed of sound is greater in solids due to high

a. density b. temperature **c. elasticity** d. pressure

13. The waves of equal frequency traveling in opposite direction give rise to

a. interference b. diffraction **c. stationary waves** d. beats

14. At the open end of an organ pipe

a. nodes is formed **b. anti-node is formed**
c. node or anti-node is formed d. neither node nor anti-node is

15. Fixed ends of a vibrating string are

a. nodes b. antinodes c. overtones d. neither nodes nor anti-nodes

16. The louder the sound, the greater will be its

a. **amplitude** b. wavelength c. speed d. frequency

17. Types of waves used in Sonar are

a. electromagnetic waves b. water waves c. matter waves **d. sound waves**

18. For each degree rise in Celsius temperature of gas, the speed of sound through it increases by

a. 0.60 m/s **b. 0.61 m/s** c. 0.60 cm/s d. 0.60 cm/s

19. The speed of sound has maximum value in

a. oxygen b. helium **c. hydrogen** d. air

20. If 20 waves pass through a medium in 1 second with a speed of 20 m/s then wavelength is

a. 20 m b. 40 m c. 400 m **d. 1 m**

21. Frequency of the waves for an organ pipe open at one end is

a. $nv / 2l$ **b. $nv / 4l$** c. $nv / 3l$ d. $4l / nv$

22. When a wave reflects from the boundary of the denser medium, reflected wave, phase change will be

a. 0^{o} b. 60^{o} c. 90^{o} **d. 180^{o}**

23. If the pressure of the gas is doubled, the velocity of sound in it will be

a. doubled b. three times c. four times **d. remains constant**

24. Doppler effect is applicable to

a. sound waves b. light waves **c. both a & b** d. none of these

25. Sound waves cannot be

a. diffracted b. refracted c. reflected **d. polarized**

26. When source of sound moves away the wavelength of sound waves

a. **increases** b. decreases c. remains constant d. none of these

27. Blue shift indicates that the stars

a. **is moving towards earth** b. is moving away from earth c. is stationary d. none

27. Frequency of the waves for organ pipe open at both ends is

a. **$nv / 2l$** b. $nv / 4l$ c. $nv / 3l$ d. $4l / nv$

28. The particles velocity at nodes of the stationary waves is

a. maximum b. minimum **c. zero** d. sometimes minimum and sometimes maximum

29. On loading the prong of a tuning fork, its frequency

a. remains constant b. increases **c. decreases** d. sometime increases sometime decreases

30. The speed of the waves produced in the stretched string depends upon the

a. tension in string b. mass per unit length of string c. length of string **d. both a & b**

31. Two tuning forks having frequencies **512** Hz and **516** Hz are sounded together, the beat frequency is

a. 1 Hz b. 2 Hz c. 3 Hz **d. 4 Hz**

32. The distance between two consecutive nodes or two consecutive antinodes in stationary waves is

a. $\lambda/4$ **b. $\lambda/2$** c. λ d. 2λ

33. Two waves of equal frequency travelling in same direction give rise to phenomena, called

a. **interference** b. beats c. compression waves d. stationary waves

34. The wavelength of the fundamental mode of stationary waves produced in an organ pipe closed at one end is

a. $\ell / 2$ b. ℓ c. 2ℓ **d. 4ℓ**

35. Newton calculated speed of sound in air at STP equal to

a. 250 m/s **b. 280 m/s** c. 300 m/s d. 333 m/s

36. Increase in velocity of sound in air for every 1 ^{o}C rise in temperature is

a. 1.61 m/s **b. 0.61 m/s** c. 16.1 m/s d. 2.0 m/s

37. Silence zone takes place due to

a. constructive interference **b. destructive interference** c. stationary waves d. beats

38. Radar is a practical application of

a. stationary waves b. beats **c. Doppler effect** d. none of these

39. Wavelength of x-rays is of the order of

a. 10^{-10} m b. 10^{-8} m c. 10^{-6} m d. 10^{-4} m

40. The speed of sound in air is at 0^{o}C is 330 m/s. Its speed at 2^{o}C is

a. 333.2 m/s b. 335 m/s c. 330 m/s **d. none of these**

41. The beats are formed when two notes of frequencies f_1 and f_2 ($f_1 > f_2$) are sounded together, then beat f will be

a. $f1 + f2$ **b. $f1 - f2$** c. $(f1 + f2) / 2$ d. $(f1 - f2) / 2$

42. The waves which do not require any medium for their propagation are called

a. mechanical waves **b. electromagnetic waves** c. matter waves d. stationary waves

43. Propagation of sound waves through air is

a. isothermal process **b. adiabatic process** c. isochoric process d. none of these

44. The density of oxygen is 16 times greater than hydrogen. The speed of sound in hydrogen ______ greater than oxygen

a. 2 times b. 3 times **c. 4 times** d. 16 times

45. Fundamental frequency of stationary waves produced in stretch string is 30 Hz. Frequency of fourth harmonics is

a. 30 Hz b. 60 Hz c. 90 Hz **d. 120 Hz**

46. When source and observer are moving in same direction with same speed, the apparent frequency will

a. increase b. decrease **c. remain same** d. becomes zero

47. When observer moves away from a stationary source with a speed equal speed of sound, apparent frequency will

a. decrease b. increase c. remain same **d. become zero**

48. When source moves towards a stationary observer with a speed equal speed of sound, apparent frequency become

a. **double** b. four time c. half d. one by four

49. The ultrasonic have the frequencies

a. in audible range b. below 20 Hz **c. above 20,000 Hz** d. none of these

50. The ratio of speed of sound in hydrogen to the speed of sound in oxygen is

a. 4:1 b. 1:4 c. 8:1 d. 1:8

51. Sound waves are

a. **longitudinal waves** b. transverse waves c. stationary waves d. standing waves

52. Two tuning forks produce two beats in the time interval of 0.4 s, so beat frequency is

a. 8 Hz **b. 5 Hz** c. 2 Hz d. 6 Hz

53. Which of the following media can transfer both longitudinal and transverse waves?

a. solid b. liquid c. plasma **d. gas**

54. If pressure is doubled the speed of sound is

a. also doubled b. become four time c. become half **d. not effected**

55. The speed of sound is has maximum value in

a. oxygen b. air **c. hydrogen** d. helium

56. A set of frequencies, which is the multiple of fundamental frequency is called

a. beat frequency **b. harmonics** c. Doppler effect d. nodal wave front

57. The wavelength of microwaves is

a. 10 cm **b. 12 cm** c. 14 cm d. 15 cm

58. Wave can transmit from one place to another

a. Wavelength b. amplitude c. matter **d. energy**

CHAPTER NO: 9

1. Polarization of light shows that light waves are

a. Compression waves **b. Transverse waves** c. Longitudinal waves d. Matter waves

2. The central point of Newton's rings with transmitted light is

a. red b. blue **c. dark** d. bright

3. Formation of colorful pattern in a thin film of oil is due to

a. **Interference** b. diffraction c. scattering d. dispersion

4. When electromagnetic waves strike the boundary of denser medium they are

a. reflected in phase b. **reflected out of phase** c. absorbed d. refracted

5. The points of constructive interference of monochromatic light are

a. always dark b**. always bright** c. neither bright nor dark d. both a & b

6. In Young's double slit experiment, the fringe spacing is equal to

a. **$\lambda L / d$** b. $d / \lambda L$ c. $\lambda d / L$ d. $2\lambda L / d$

7. The wave nature of light was proposed by
a. Thomas Young b. Fresnel c. Maxwell **d. Huygens**

8. Huygen's principle is used to
a. explain polarization **b. locate new wave front** c. find the speed of light d. find refractive index

9. The distance between two consecutive dark fringes is called
a. wave length **b. fringe spacing** c. wavelet d. amplitude

10. The fringe spacing in a double slit experiment can be increased by decreasing
a. wavelength of light b. width of slits **c. slit separation** d. distance b/w slit and screen

11. Oscillating charges produces
a. Mechanical waves **b. electromagnetic waves** c. matte waves d. longitudinal waves

12. The angle of 180^{o} is equivalent to a path difference of
a. λ **b. $\lambda/2$** c. $\lambda/4$ d. 2λ

13. The polarization of light can be achieved by the process of
a. selective absorption b. reflection c. refraction **d. all of these**

14. When sunlight passes through atmosphere, its energy reduces due to
a. reflection of dust particles b. scattering by dust particles c. absorption by dust particles **d. All of these**

15. If mirror M_1 in Michelson Interferometer is moved by a distance of $\lambda/4$, then path difference is
a. 2λ b. λ **c. $\lambda/2$** d. $\lambda/4$

16. A line normal to wave front indicating the direction of motion is called
a. wave **b. ray** c. pulse d. none of these

17. The condition for constructive interference of two coherent beams is that the path difference should be
a. odd integral multiple of $\lambda/2$ **b. integral multiple of λ**
c. integral multiple of $\lambda/2$ d. integral multiple of $\lambda/4$

18. The distance between two bright fringes__________distance between two consecutive dark fringes
a. is greater than **b. is equal to** c. is less than d. has no comparison

19. The appearance of colors in the bubble of soap when sun light falls on it, is due to
a. diffraction b. polarization **c. interference** d. dispersion

20. Bending of light around sharp obstacles is called
a. **diffraction** b. polarization c. interference d. dispersion

21. The distance b/w two consecutive wave fronts is called
a. time period b. frequency **c. wavelength** d. displacement

22. Newton's rings are formed due to
a. diffraction **b. interference** c. polarization d. refraction

23. The polaroid sun glasses are better than ordinary sun glasses because they
a. increase intensity of light **b. decrease intensity of light** c.do not change intensity of light d. none

24. Michelson's interferometer can be used to measure
a. amplitude of light **b. wavelength of light** c. speed of light d. intensity of light

25. One angstrom (Å) is equal to
a. 10^{-10} m b. 10^{-9} m c. 10^{-12} m d. 10^{-15}m

26. If N is number of lines per meter in grating of length L, its grating element is given by
a. N / L **b. L / N** c. L /2 N d. 2 N/ L

27. Confinement of light into one plane of vibration is called
a. diffraction **b. polarization** c. Interference d. dispersion

28. When one mirror of a Michelson interferometer is move a distance of 05 mm, 2000 fringes are observed, the wavelength of light used is
a. 2000 Å b. 5000 Å c. 1000 cm **d. none of these**

29. The blue color of sky is due to
a. diffraction b. interference c. polarization **d. scattering**

30. The effective path difference b/w two reflected beams in x-ray diffraction by nickel crystal is
a. $d\sin\theta$ **b. $2d\sin\theta$** c. $d/2 \sin\theta$ d. $d\sin(\theta/2)$

31. Light reaches from the sun to the earth in the form of
a. spherical wave front **b. plane wave front** c. circular wave front d. cylindrical wave front

32. The velocity of light was determined accurately by:
(a) Newton **(b) Michelson** (c) Huygen (d) Young

33. In case of point source the shape of wave front is
(a) circular **(b) spherical** (c) elliptical (d) square

34. The phenomena of interference of light is a
a. **wave characteristics** b. Particle characteristic c. Both wave and particle characteristic d. None

35. Huygen's principle is used to determine the
a) Interference of wave fronts b) Nature of light
c) Shape and location of new wave front d) Speed of light

36. An oil film floating on water surface exhibits beautiful colors due to
a) Diffraction b) Polarization **c) Interference** d) None

37. Light waves produce interference when they are
a) Monochromatic b) Coherent c) Sources are close together **d) All of these**

38. Two wave traveling in the same direction interfere destructively if their path difference is
a) $m\lambda$ **b) $(m + ½)\lambda$** c) $(m - ½)\lambda$ d) $2m\lambda$

39. Basically young's double slit experiment exhibits
a) Diffraction b) Polarization c) Reflection **d) Interference**

40. The fringe spacing in young's double slit experiment varies
a) Inversely with wavelength b) Directly with 'd' **c) Inversely with 'd'** d) Inversely with 'L'

41. The dark and bright fringes, in young's double slit experiment are of
a) Variable width **b) Same width** c) Zero width d) None of these

42. Which of the following light is used to increase the fringe spacing?
a) Red light b) Yellow light c) Green light d) Blue light

43. In Newton's rings, the thin film between convex less and the glass plate is the
a) glass film **b) air film** c) light film d) oil film

44. In Michelson interferometer, the path difference is varied by moving the
a) compensator plate **b) movable mirror** c) telescope d) fixed mirror

45. Diffraction is prominent when the wavelength of light as compared with size of obstacle is
a) large b) small c) very small d) zero

46. Diffraction of X-rays will be prominent when inter-planer spacing of obstacle is_______wavelength of x-rays
a) greater than **b) less than** c) comparable with d) much greater than

47. The wavelength of x-rays incident at Bray angle of 30^{o} on a sodium crystal with atomic spacing 2×10^{-10} m for the first order reflection is
a) 0.5×10^{-10} m b) 1×10^{-10} m **c) 2×10^{-10} m** d) 3.46×10^{-10} m

48. Which one of the following cannot be polarized?
a) X-rays b) light waves **c) sound waves** d) ultraviolet rays

49. At the point of contact of lens and glass plate in Newton's rings, the thickness of air film is
a. **zero** b. 0.1 mm c. 0.2 mm d. 0.3 mm

50. The precision of Michelson interferometer is
a. 10^{-2} mm b. 10^{-3} mm **c. 10^{-4} mm** d. 10^{-5} mm

51. A typical diffraction grating has about__________lines per centimeter.
a. 300 to 3000 b. 300 to 4000 c. 400 to 4000 **d. 400 to 5000**

52. X-ray diffraction is useful to find the structure of
a. hemoglobin b. DNA **c. both a & b** d. none of these

53. Optical rotation can be done with
a. Sugar solution b. tartaric acid **c. Both a & b** d. HCl

54. Light is produced by oscillating charges. Light can be polarized when this oscillation is confined to
a. **one plane** b. two planes c. three planes d. four planes

CHAPTER NO: 10

1. The least distance of distinct vision for a normal eye is
a. **25 cm** b. 26 cm c. 27 cm d. 28 cm

2. When object is held at focus point the image is formed
a. at focus point b. away from focus point c. between focus point and center of curvature **d. at infinity**

3. The magnifying power of compound microscope is
a. $q / p (1 + d / f_o)$ **b.** $\mathbf{q / p (1 + d / f_e)}$ c. $q / p (1 + f_e / f_o)$ d. $q / p (1 + f_o / d)$

4. In an astronomical telescope the focal length of objective lens is_______than eyepiece
a. less b. equal to **c. greater** d. none of these

5. The main part of spectrometer is
a. collimator b. telescope c. turntable **d. all of these**

6. The principle of communication of data through fiber optics is based upon
a. diffraction b. polarization c. continuous refraction **d. continuous refraction and TIR**

7. The size of fiber optics is
a. very large b. large c. small **d. very small**

8. The main sources of loss of data in fiber optics are
a. scattering b. absorption c. dispersion **d. all of these**

9. The ability of an optical instrument to reveal minor details is called
a. magnifying power b. refraction **c. resolving power** d. magnification

10. Alexander Graham Bell also invented
a. transmitter b. radio c. wireless **d. photo-phone**

11. The diameter of core of multimode graded index fiber is
a. 50 to 100 µm b. 50 to 200 µm c. 50 to 500 µm **d. 50 to 1000 µm**

12. Single mode step index fiber carry the information with the help of
a. **laser light** b. white light c. blue light d. x-rays

13. When slit is at the focus of the convex lens of collimator in spectrometer, the light rays becomes
a. perpendicular **b. parallel** c. antiparallel d. at 60^o

14. The length of an astronomical telescope is given by the formula
a. f_o / f_e b. f_e / f_o c. $f_o - f_e$ **d.** $\mathbf{f_o + f_e}$

15. Photodiode is used convert light signal to
a. **electrical signal** b. sound signal c. both a & b d. cannot be used as convertor

16. The wavelength of light is of the order of
a. 1 Å b. 10 Å c. 100 Å **d. 1000 Å**

17. A convex lens acts as diverging lens when the object is placed
a. at 2f b. between f and 2f c. at f **d. inside focus**

18. Image formed by a convex lens of focal length 10 cm is twice the size of object. The position of object will be
a. 20 cm b. 50 cm c. 30 cm **d. 15 cm**

19. When telescope is in normal adjustment its length is given by the formula

a. **$f_o + f_e$** b. $f_o - f_e$ c. f_o / f_e d. f_e / f_o

20. If a convex lens of focal length f is cut into two identical halves along the lens diameter, focal length of each half is

a. **2f** b. f c. both a & b d. none of these

21. In Michelson's experiment, the equation used to find the speed of light is

a**. c = 16 f d** b. c = 16 f / d c. c = 16 d / f d. c = 1 / 16 f d

22. The value of critical angle for glass-air boundary is

a. 41.8^o b. 41.5^o c. 42^o d. 42.8^o

23. The magnifying power of simple microscope is

a. $q / p\ (1+ d / f_0)$ **b. (1+ d / f)** c. $q / p\ (1+ f_e / f_0)$ d. $q / p\ (1+ f_0 / d)$

24. In a compound microscope, the focal length of eyepiece is________than objective

a. less b. equal to **c. greater** d. none of these

25. The part of the spectrometer which makes the light rays parallel is called

a. **collimator** b. telescope c. turntable d. all of these

26. A convex lens gives virtual image only when object is placed

a. at focus b. between focus and centre of curvature **c. inside focus** d. away from centre of curvature

27. An object is placed at a distance of 2 m from a convex lens of focal length 2.5 m. its image will be

a. real and erect **b. virtual and magnified** c. real and magnified d. real and inverted

28. Cladding in the fiber optics is used

a. to absorb light **b. for T.I.R (total internal Ref.)** c. for dispersion d. to transmit light

29. Least distance of distinct vision

a. increases with increase of age b. deceases with increase of

c. measures refractive index of material d. all of these

30. In optical fiber communication system, the wavelength of light used is

a. 1.3 µm b. 1.5 µm c. 5 µm d. 50 µm

31. The final image formed by simple microscope is

a. **virtual & inverted** b. virtual & erect c. real & erect d. real & inverted

32. The magnifying power of a convex lens of focal length 10 cm is

a. 7 b. 9.6 c. 11 **d. 3.5**

33. The diameter of core of single mode strep index fiber is

a. 5 µ m b. 10 µ m c. 30 µ m d. 100 µ m

34. Microphone is used convert sound signal into

a. **electrical signal** b. light c. both a & b d. cannot be used as convertor

35. A single convex lens is placed close to eye, then it is being used as

a. telescope b. microscope **c. magnifying glass** d. none of these

36. Fiber optic cable carries data in the form of

a. electrical signal b. sound signal **c. light** d. heat

37. A point inside the lens through which a light ray does not deviate is called

a. pole b. focus point c. centre of curvature **d. optical centre**

38. When light passes from denser medium to rare medium

a. **it bends away from normal** b. it bends towards normal c. it does not bend d. diffracted

39. The optical fibers are of

a. two types **b. three types** c. four types d. five types

40. Which is the optical instrument

a. telescope b. microscope c. spectrometer **d. all of these**

41. The layer over the central core of fiber optics is called

a. jacket **b. cladding** c. plastic d. rubber

42. The angle subtended by an object at the eye is called
a. **Visual angle** b. Critical angle c. Polarizing angle d. None

43. In normal adjustment, distance between objective and eyepiece of Astronomical Telescope is equal to
a. Focal length of objective **b. Length of telescope**
c. Magnifying power of telescope d. Aperture of objective

44. The speed of light in other materials as compared to vacuum
a. Greater **b. Lesser** c. Equal d. Zero

45. The ratio of speed of light in vacuum to the speed of light in certain material is called
a. Wavelength **b. Refractive Index** c. Snell's law d. T.I.R.

46. Which source of light is used by multimode graded index fiber?
a. Monochromatic b. Laser **c. White light** d. Ultraviolet light

47. Which of the following is true for cladding?
a. It absorbs unwanted light b. It transmits the light **c. It produces T.I.R.** d. It scatters light

48. The minimum angle subtended by two point sources (α_{min}) at the instrument will be greater if
a. diameter of lens is greater **b. diameter of lens is smaller** c. wavelength of light is small d. All

49. The speed of light was measured correctly by .
(a) Galileo **(b) Michelson** (c) Newton (d) Maxwell

50. The device used to study the spectra from different sources of light is
(a) telescope (b) optical fiber **(c) spectrometer** (d) microscope

51. A fiber optics communication system consists of
a. a transmitter b. an optical fiber c. a receiver **d. all of these**

52. Which is the principle of communication for single mode step index fiber?
a. **T.I.R** b. continuous refraction c. reflection d. transmission

53. Which of the following is necessary to increase the resolving power of a microscope?
a. a wider objective **b. light of shorter wavelength** c. both a & b d. x-rays

54. If N is no. of ruled lines in the grating and m is the order of diffraction, then resolving power can be given by
a. **R= N x m** b. R= N / m c. R= m / N d. R= N + m

55. If focal length is 5 cm the power of lens is
a. 5 D b. 10 D c. 15 D **d. 20 D**

56. An astronomical telescope is made with the objective of focal length 100 cm and eye piece of focal length is 5 cm the length of telescope when focused or infinity is
a. 20 cm b. 95 cm c. 100 cm **d. 105 cm**

57. The refractive index of water is 1.33, the speed of light in water is
a. $3x10^8$ m/s b. $1.5x10^8$ m/s **c. $2.8x10^8$ m/s** d. zero

58. In the newer system of fiber optics, signals are regenerated by placing repeaters, which may be repeated as much as
a. 30 km b. 50 km **c. 100 km** d. 500 km

CHAPTER NO: 11

1. Carnot cycle is
   a. **reversible** b. irreversible c. both a & b d. none of these
2. Isothermal process is carried out at constant
   a. volume b. pressure **c. temperature** d. entropy
3. In reversible process, the entropy of the system
   a. decreases b. increases **c. remains constant** d. initially increases
4. The efficiency of Carnot engine depends upon
   a. sink temp. b. source temp. **c. both a & b** d. working substance
5. The Boltzmann constant k is equal to
   a. RN_A **b. R/N_A** c. N_A / R d. $1/RN_A$
6. The efficiency of petrol engine is
   a. 25% to 30 % b. 30% to 35 % c. 35% to 40 % d. 20% to 30%
7. The mass of gas is doubled at constant temperature then density of the gas becomes
   a. double b. half c. one forth **d. unchanged**
8. The value of γ for diatomic gases is
   a. 1.67 **b. 1.40** c. 1.29 d. zero
9. The process in which entropy of the system remains constant is called
   a. adiabatic process **b. isothermal process** c. isochoric process d. isobaric process
10. Heat engine converts heat energy into
    a. electrical energy b. sound energy **c. mechanical energy** d. light energy
11. Which is not an example of adiabatic process?
    a. rapid escape of air from burst tyre b. rapid expansion of air
    c. conversion of water into ice d. cloud formation
12. A bicycle pump provides a good example of____________law of thermodynamics
    a. **first** b. second c. both a & b d. $zero^{th}$
13. The pressure exerted by the gas on the walls of vessel is directly proportional to
    a. **avg. translational K.E** b. avg. rotational K.E c. P.E. d. avg. vibrational K.E.
14. The internal energy of the gas molecules is equal to
    a. **kinetic energy** b. potential energy c. both a & b d. none of these
15. The form of first law of thermodynamics for adiabatic process will be
    a. Q = W b. Q = -W **c. W = - ΔU** d. W = ΔU
16. The S.I unit of entropy is
    a. J K **b. J/K** c. K/J d. J/mol
17. In an isothermal process, first law can be written as
    a. Q = ΔU + W **b. Q = ΔU** c. Q =0 d. Q = W
18. In a thermodynamics process, the equation Q = ΔU represents
    a. isothermal process b. adiabatic process **c. volume is constant** d. none of these
19. When temperature of source and sink of a heat engine become equal, the entropy change will be
    a. **Zero** b. maximum c. minimum d. negative
20. The efficiency of diesel engine is about
    a. 25% to 30 % **b. 30% to 35 %** c. 35% to 40 % d. 20% to 30%
21. During melting of ice, the entropy of the system
    a. **increases** b. decreases c. remains constant d. becomes zero

22. Heat is form of
a. power b. work **c. energy** d. momentum

23. Pressure of a gas is due to transfer of_______________to the walls of the vessel.
a. energy per second b. work per second **c. momentum per second** d. all of these

24. The property of molecules of a gas which is same for all gasses at a particular temperature is
a. momentum b. velocity c. mass **d. kinetic energy**

25. When pressure is increased, the boiling point of the liquid
a. decreases **b. increases** c. remains same d. becomes zero

26. The volume of given mass of gas is doubled at constant temperature then density of the gas becomes
a. double **b. half** c. one forth d. unchanged

27. The heat required to raise the temperature of one kg of a substance through one Kelvin is called
a. heat of vaporization **b. specific heat** c. heat of fusion d. molar specific heat

28. The molar specific heat of a gas at constant pressure is ________ than molar specific heat of at constant volume
a. **greater** b. less c. same d. none of these

29. For proper working of a heat engine, we require
a. hot body b. cold body **c. both a & b** d. nobody is required

30. In _________ process, the entropy of the system remains constant
a. **isothermal** b. adiabatic c. isochoric d. isobaric

31. The triple point of the water is equal to
a. Zero degree b. 273.16 K **c. both a & b** d. 373 K

32. The working cycle of typical petrol engine consist of
a. two strokes b. three strokes **c. four strokes** d. eight strokes

33. The highest efficiency of a heat engine whose lower temperature is at 17^{o}C and higher temperature or 200^{o}C is a. 70% b. 60% **c. 38%** d. 35%

34. Propagation of sound waves in air follows
a. isothermal process **b. adiabatic process** c. isochoric process d. isobaric process

35. At constant temperature, if the density of the gas is increased, its pressure will
a. **decrease** b. increase c. remains same d. none of these

36. Pressure exerted on the walls of container of gas is equal to
a. **change in momentum** b. change in K.E c. change of mass d. change of P.E.

37. For an ideal gas system, the internal energy is directly proportional to
a. pressure b. density c. volume **d. temperature**

38. If the temperature of sink is decreased, the efficiency of a Carnot engine
a. remains same **b. increases** c. decreases d. none of these

39. Area under PV graph of Carnot engine represents the
a. heat absorbed b. heat rejected **c. total work done** d. all of these

40. The motion of molecules of gas contained in container is
a. orderly **b. random** c. circular d. projectile

41. A hot iron ball is dropped into a jar of cold water, the entropy of the water
a. **increases** b. decreases c. remains same d. first increase and then decreases

42. Net change in entropy of a system in a Carnot cycle is
a. positive b. negative c. maximum **d. zero**

43. When water is heated from 0^{o}C to 4^{o}C, then
a. **$C_p > C_v$** b. $C_p < C_v$ c. $C_p = C_v$ d. $C_p + C_v = R$

44. The readings of temperature on centigrade scale and Fahrenheit scale become equal is
a. $-273\ ^{o}$C b. $273\ ^{o}$C **c. $-40\ ^{o}$C** d. 0^{o}C

45. S.I unit of temperature is
a. ampere **b. kelvin** c. Celsius d. Fahrenheit

46. In an irreversible process, entropy of the system
a. remains same **b. increases** c. decreases d. may increase or decrease

47. The graph between V and T at constant pressure is
a. circle b. parabola c. hyperbola **d. straight line**

48. At thermal equilibrium the entropy of the system will be
a. minimum b. maximum c. zero **d. constant**

49. The amount of heat required to melt one kg of ice at 0^oC is called
a. heat of vaporization b. specific heat **c. latent heat of fusion** d. molar specific heat

50. At constant temperature, if volume of given gas is doubled then density of the gas becomes
a. double b. ¼ of original **c. ½ of original** d. unchanged

51. Boyle's law applies to ________ process
a. **isothermal** b. adiabatic c. isochoric d. isobaric

52. Average K.E. of molecules of a gas gives us
a. heat b. temperature c. entropy **d. internal energy**

53. The entropy of the universe always
a. **increases** b. decreases c. remains zero d. remains constant

54. The diesel engine does not have
a. piston **b. spark plug** c. inlet valve d. outlet valve

55. In petrol engine ignition, to the compressed mixture of fuel and air, is given by
a. high friction **b. spark plug** c. temp. of hot body d. all of these

56. Efficiency of heat engine depends upon
a. temp. of source b. temp. of sink **c. difference of temp. of source and sink** d. none of these

57. When gas is compressed at constant volume, the work done on the system is
a. Maximum b. minimum **c. zero** d. positive